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MEMORANDUM FOR PKC

FROM: NA
SUBJECT: Receipt of Final Technical

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LELAND STANFORD JUNIOR UNIVERSITY

Progress on subject report covering the period from   November   1   2009   to   April   1   2007
:

Received on :   February   7   2010
Report Review:
⚠   Accept

Accepted on :   March   8   2010

Non acceptance-Contractor has been verbally informed of nonacceptance and a resubmission suspense date of

is recommended. Attached is Principal Contracting Officer (PCO) letter to the Business Office and PI detailing reasons for nonacceptance and establishing a resubmittal date.

Annual Accomplishments:

The numerically stable loosely-coupled partitioned solution
procedures for the fast steady and unsteady multidisciplinary
thermal analysis of hot aerospace structures were further
refined to accelerate convergence in the steady-state case and
improve robustness in all cases. The refinement was obtained

Archival Publications During
Period:

S. Brogniez and C. Farhat, Numerically Stable Loosely-Coupled
Partitioned Procedures for the Fast Steady and Unsteady
Analysis of High-Speed Aerothermal Problems, Journal of
Computational Physics (to be submitted)

Changes in Research Objectives: none

Change in AFOSR PM: none

Extensions Granted or
Milestones Slipped: none

Comments:

Program Manager: Stargel, David (afosr-2k\st

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Profile Report

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Page One

1. Principal InvestigatorName:

Charbel Farhat

2. Grant/Contract Title:

Multidisciplinary Thermal Analysis of Hot Aerospace Structures

3. Grant/Contract Number:

FA9550-07-1-0278

4. Reporting Period Start (MM/DD/YYYY):

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5. End (MM/DD/YYYY):

04/01/2007

6. Program Manager:

Dr. John Schmisseur

7. Distribution Statement (as on SF-298)

Distribution A - Approved for public release

8. Annual Accomplishments (200 words maximum):

The numerically stable loosely-coupled partitioned solution procedures for the fast steady and unsteady multidisciplinary thermal analysis of hot aerospace structures were further refined to accelerate convergence in the steady-state case and improve robustness in all cases. The refinement was obtained based on the mathematical analysis of the formulation of these algorithms for the continuous counterpart of the problem of interest. The resulting coupled solution methods were successfully applied to the multidisciplinary thermal analysis of a model of the HI-SHOT configuration. They have achieved the desired robustness and speed.

9. Archival Publications (published) during reporting period:

S. Brogniez and C. Farhat, Numerically Stable Loosely-Coupled Partitioned Procedures for the Fast Steady and Unsteady Analysis of High-Speed Aerothermal Problems, Journal of Computational Physics (to be submitted)

S. Brogniez, A. Rajasekharan and C. Farhat, Provably Stable and Order of Accuracy Preserving Extensions to Dynamic Grids of Runge-Kutta Schemes, Journal of Computational Physics (to be submitted)

A. Rajasekharan and C. Farhat, Applications of a Variational Multiscale Method for Large Eddy Simulation of Turbulent Flows on Moving/Deforming Unstructured Grids, Finite Elements in Analysis and Design, Vol. 45, pp. 272-279 (2009)

C. Farhat and A. Rajasekharan, A Computational Framework Based on the Variational LES Method for the Multidisciplinary Analysis of MAVs with Flapping Wings, 26th Army Science Conference, Transformational Army Science & Technology - Harnessing Disruptive S&T for the Soldier, Orlando, Florida, December 1-4 (2008)

C. Farhat, T. Lieu and V. Kongara, A Discussion of Key Concepts and Methodologies for the CFD-Based Solution of a Class of Nonlinear Fluid/Structure and Thermofluid/ Thermostructure Problems, in: Proceedings of the International Conference on Computational Methods for Coupled Problems in Science and Engineering, ed. E. Onate, M. Papadrakakis and B. Schrefler, CIMNE, Barcelona (2007)

10. Changes in research objectives (if any):

11. Change in AFOSR program manager, if any:

12. Extensions granted or milestones slipped, if any:

13. Attach Final Report (max. 2MB)(If the report is larger than 2MB, please email file to program manager.)

14. Please attach saved SF298 Form here:

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